



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/728,731	12/04/2003	Konstantinos Tsougarakis	2960/117	1752

2101 7590 08/03/2007  
BROMBERG & SUNSTEIN LLP  
125 SUMMER STREET  
BOSTON, MA 02110-1618

EXAMINER
----------

TABATABAI, ABOLFAZL

ART UNIT	PAPER NUMBER
----------	--------------

2624

MAIL DATE	DELIVERY MODE
-----------	---------------

08/03/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

**Office Action Summary**

Application No.

10/728,731

Applicant(s)

TSOUGARAKIS ET AL.

Examiner

Abolfazl Tabatabai

Art Unit

2624

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 04 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-41 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-41 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### **Claim Rejections - 35 USC § 102**

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 3-6, 9, 18, 22, 24-26 and 29 are rejected under 35 U.S.C. 102(b) as being anticipated by Webber (U. S. 6,081,577).

Regarding claim 1, Webber discloses an image analysis method comprising:

obtaining a first image of a body part in a first plane (column 20, lines 22-31), wherein the first image generates a first image data volume (column 4, lines 40-47 and column 21, lines 15-57);

obtaining a second image of the body part in a second plane (column 20, lines 22-31), wherein the second image generates a second image data volume (column 4, lines 40-47 and column 21, lines 15-57); and,

combining (column 4, lines 54-58), the first and second image data volumes to form a resultant image data volume, wherein the resultant image data volume is isotropic (column 19, lines 63-67).

Regarding claim 3, Webber discloses the method according to claim 1, wherein said second image is taken at an angle between about 0 and about 180 degrees from the first image (column 25, lines 55-62).

Regarding claim 4, Webber discloses the method of claim 1, wherein the first

Art Unit: 2624

image is taken at a first angle and the second image is taken at a second angle, and further wherein the first angle does not equal the second angle (column 4, lines 20-31).

Regarding claim 5, Webber discloses the method of claim 1, wherein the first image is taken at a first time and the second image is taken at a second time (column 3, lines 22-27).

Regarding claim 6, Webber discloses the method of claim 3, wherein the second image is taken at an angle between about 0 and about 90 degrees from the first image. (column 27, lines 19-20).

Regarding claim 9, Webber discloses the method of claim 1, further including: obtaining at least one additional image of a body part in a plane different than other planes, wherein the additional image generates an additional image data volume, wherein the additional data volume is combined with the first and second image data volumes to form a resultant data volume (column 4, lines 17-31).

Claims 18, 22, 24 and 25 are similarly analyzed as claim 1 above.

Regarding claim 26, Webber discloses a method for generating a three-dimensional data volume comprising:

acquiring at least a first data volume and a second data volume from at least a first image and a second image, wherein the first image is obtained in a first plane and the second image is obtained in a second plane and further wherein the first plane is not equal to the second plane (column 20, lines 22-310; combining the first data volume and the second data volume to form a resultant data volume (column 4, lines 24-31);

monitoring a therapy utilizing the resultant data volume (column 19, lines 37-49).

Claim 29 is similarly analyzed as claim 6 above.

### **Claim Rejections - 35 USC § 103**

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 2, 19 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Webber (U. S. 6,081,577) in view of Thesen et al (U. S. 6,556,855 B2).

Regarding claim 2, Webber is silent about the specific details regarding the method according to claim 1, wherein the combining step comprises:

obtaining from said first and second image data volume first and second gray values at a three-dimensional position; interpolating a resultant gray value from said first and second gray values; and,

assigning said resultant value to a voxel at said three-dimensional position of said resultant data volume.

In the same field of endeavor (medical imaging), however, Thesen discloses method for implementation of a perfusion measurement with magnetic resonance imaging comprising the step of:

obtaining from said first and second image data volume first and second gray values at a three-dimensional position (column 6, lines 24-31); interpolating (column 4, lines 54-58) a resultant gray value from said first and second gray values (column 6, lines 24-31); and,

assigning said resultant value to a voxel at said three-dimensional position of said resultant data volume (column 6, lines 9-16).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use gray values and interpolation as taught by Thesen in the system of Webber because Thesen provides Webber an improved method for the implementation of a perfusion measurement with MRI that, among other things avoids the aforementioned disadvantages of known perfusion measurements.

Claims 19 and 27 and are similarly analyzed as claim 2 above.

Art Unit: 2624

6. Claims 7, 8, 10-17, 20, 21, 23, 28 and 30-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Webber (U. S. 6,081,577) in view of Aylward et al (U. S. 6,690,816 B2).

Regarding claim 7, Webber is silent about the specific details regarding the method of claim 1, further including: selecting a therapy in response to the resultant image data volume.

In the same field of endeavor (medical imaging), however, Aylward discloses systems and methods for tubular object processing comprising the step of:

selecting a therapy in response to the resultant image data volume (column 29, lines 1-3).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use a therapy as taught by Aylward in the system of Webber because Aylward provides Webber an improved for stable, accurate, and fast representation and analysis of tubular objects in multi-dimensional images.

Regarding claim 8, Webber is silent about the specific details regarding the method of claim 1, further including: selecting a treatment in response to the resultant image data volume.

In the same field of endeavor (medical imaging), however, Aylward discloses systems and methods for tubular object processing comprising the step of:

selecting a treatment in response to the resultant image data volume (column 29, lines 1-3).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use a treatment as taught by Aylward in the system of Webber because Aylward provides Webber an improved for stable, accurate, and fast representation and analysis of tubular objects in multi-dimensional images.

Regarding claim 10, Webber is silent about the specific details regarding the method of claim 1, further including: extracting a boundary image data volume from the resulting image data volume.

In the same field of endeavor (medical imaging), however, Aylward discloses systems and methods for tubular object processing comprising the step of:

extracting a boundary image data volume from the resulting image data volume (column 24, lines 16-19).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use extracting a boundary image data volume as taught by Aylward in the system of Webber because Aylward provides Webber an improved for stable, accurate, and fast representation and analysis of tubular objects in multi-dimensional images.

Regarding claim 11, Webber discloses a method for producing isotropic or near-isotropic image data comprising:

obtaining a first image data volume from a first image in a first plane (column 20, lines 22-31);

obtaining a second image data volume from a second image in a second plane (column 20, lines 22-31).



Art Unit: 2624

However, Webber is silent about the specific details regarding the steps of:

extracting boundary image data from each of the first and second image data volumes; and,

combining the extracted boundary image data to form a resultant image data volume.

In the same field of endeavor (medical imaging), however, Aylward discloses systems and methods for tubular object processing comprising the step of:

extracting boundary image data from each of the first and second image data volumes (fig.4, element 440 and column 24, lines 16-19); and,

combining the extracted boundary image data to form a resultant image data volume (column 10, lines 33-43).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use extracting a boundary image data volume as taught by Aylward in the system of Webber because Aylward provides Webber an improved for stable, accurate, and fast representation and analysis of tubular objects in multi-dimensional images.

Claim 12 is similarly analyzed as claim 11 above.

Regarding claim 13, Webber discloses the method of claim 11, wherein the resultant image data volume is near isotropic (column 19, lines 63-67).

Regarding claim 14, Webber discloses the method of claim 11, wherein the resultant image data volume is isotropic (column 6, lines 65-67).

Claim 15 is similarly analyzed as claim 4 above.

Claim 16 is similarly analyzed as claim 3 above.

Claims 17, 21 and 29 are similarly analyzed as claim 6 above.

Claims 20, 28 are similarly analyzed as claim 10 above.

Regarding claim 23, Webber is silent about the specific details regarding the method of claim 22, wherein the resultant resolution is greater than the default resolution.

In the same field of endeavor (medical imaging), however, Aylward discloses systems and methods for tubular object processing comprises the resultant resolution is greater than the default resolution (column 9, lines 14-26).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the resultant resolution is greater than the default resolution as taught by Aylward in the system of Webber because Aylward provides Webber an improved for stable, accurate, and fast representation and analysis of tubular objects in multi-dimensional images.

Regarding claim 30, Webber is silent about the specific details regarding the method of claim 26, wherein said treatment includes a drug.

In the same field of endeavor (medical imaging), however, Aylward discloses systems and methods for tubular object processing comprises a drug (column 26, line 58).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use a drug as taught by Aylward in the system of Webber because Aylward provides Webber an improved for stable, accurate, and fast

representation and analysis of tubular objects in multi-dimensional images.

Regarding claim 31, Webber is silent about the specific details regarding the method of claim 26, wherein said treatment includes a bioactive agent.

In the same field of endeavor (medical imaging), however, Aylward discloses systems and methods for tubular object processing comprises a bioactive agent (column 27, lines 49-55).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use a bioactive agent as taught by Aylward in the system of Webber because Aylward provides Webber an improved for stable, accurate, and fast representation and analysis of tubular objects in multi-dimensional images.

Regarding claim 32, Webber is silent about the specific details regarding the method of claim 26, wherein said treatment includes surgery.

In the same field of endeavor (medical imaging), however, Aylward discloses systems and methods for tubular object processing comprises a surgery (column 19, lines 31-3).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use a surgery as taught by Aylward in the system of Webber because Aylward provides Webber an improved for stable, accurate, and fast representation and analysis of tubular objects in multi-dimensional images.

Claim 33 is similarly analyzed as claim 5 above.

7. Claims 34 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Webber (U. S. 6,081,577) in view of Bonutti (U. S. 6,702,821 B2).

Regarding claim 34, webber discloses a method for generating a three-dimensional data volume comprising:

acquiring at least two data volumes from at least two images performed in two different planes (column 20, lines 22-31); combining the data volumes to form a resultant data volume (column 4, lines 24-31).

However, Webber is silent about the specific details regarding the step of:

selecting an implant utilizing the resultant data volume.

In the same field of endeavor (medical imaging), however, Bonutti discloses instrumentations for minimally invasive joint replacement and methods for using same comprising the step of:

selecting an implant utilizing the resultant data volume (column 55, lines 17-30).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use an implant shape as taught by Bonutti in the system of Webber because Bonutti provides Webber an improved system for use in performing any desired type of surgery on a joint in a patient's body. The joint may advantageously be a knee joint. This system may be used in association with surgery on other joints in a patient's body.

Regarding claim 38, webber discloses a method for generating a three dimensional data volume comprising:

acquiring at least two data volumes from at least two images performed in two different planes(column 20, lines 22-31);

combining the data volumes to form a resultant data volume (column4, lines

Art Unit: 2624

24-31).

In the same field of endeavor (medical imaging), however, Bonutti discloses instrumentations for minimally invasive joint replacement and methods for using same comprising the step of:

deriving an implant shape utilizing the resultant data volume (column 51, lines 31-36).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use an implant shape as taught by Bonutti in the system of Webber because Bonutti provides Webber an improved system for use in performing any desired type of surgery on a joint in a patient's body. The joint may advantageously be a knee joint. This system may be used in association with surgery on other joints in a patient's body.

8. Claims 35-37 and 39-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Webber (U. S. 6,081,577) and Bonutti (U. S. 6,702,821 B2) as applied to claims 34 and 38 and further in view of Thesen et al (U. S. 6,556,855 B2).

Claims 35 and 39 are similarly analyzed as claim 2 above.

Claims 36 and 40 are similarly analyzed as claim 10 above.

Claims 37, 39 and 41 are similarly analyzed as claim 6 above.

### **Contact Information**

9. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to ABOLFAZL TABATABAI whose telephone number is (571) 272-7458.

The Examiner can normally be reached on Monday through Friday from 9:30 a.m. to 7:30 p.m. If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Bhavesh Mehta, can be reached at (571) 272-7453. The fax phone number for organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Abolfazl Tabatabai

Patent Examiner

Technology Division 2624

July 31, 2007

*A-Tabatabai*